

REMARKS

Claims 1, 3-9 and 11-20 are currently pending in the application. Claims 1 and 4 are independent.

By the instant amendment, claims 1 and 4 are amended.

A. Introduction

In the outstanding Office Action Made Final,

- 1) claims 1, 4, 6-8, 17 and 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by “A Thermal Bubble Actuated Micro Nozzle-Diffuser Pump,” *The 14th IEEE International Conference on Micro Electro Mechanical Systems*, Interlaken, Switzerland, Jan. 21-25, 2001, to Tsai et al. (“the Tsai et al. reference”);
- 2) claims 1, 6-9, 11-16 and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,387,314 to Baughman et al. (“the Baughman et al. reference”);
- 3) claims 3 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tsai et al. reference;
- 4) claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference;
- 5) claim 16 was rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over, the Baughman et al. reference as applied to claim 15, and further evidenced by U.S. Patent No. 6,428,875 to Takahashi et al. (“the Takahashi et al. reference”);
- 6) claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference; and
- 7) claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference as applied to claim 13.

B. Asserted Anticipation Rejection of Claims 1, 4, 6-8, 17 and 20

In the outstanding Office Action Made Final, claims 1, 4, 6-8, 17 and 20 were rejected under 35 U.S.C. § 102(b) as being anticipated by the Tsai et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

1. Claim 1

Claim 1 recites, *inter alia*, “wherein the cross-sectional area of the fluid entrance decreases in a direction toward the pumping chamber, and the cross-sectional area of the fluid

exit increases in a direction toward the pumping chamber” (emphasis added). The Office Action Made Final and the Advisory Action asserted that the Tsai et al. reference discloses this subject matter. Applicants respectfully disagree, and respectfully submit that the Tsai et al. reference discloses just the opposite.

As set forth in detail in applicants’ reply filed July 2, 2008, applicants respectfully submit that the rejection of claim 1 is improper because the rejection relies on an interpretation of claim 1 that is inconsistent with the rejection of claim 4, and is inconsistent with applicants’ disclosure. In response to applicants’ reply, the Advisory Action asserted, *inter alia*, “the limitations of claim 1 are sufficiently broad to allow for any port, conduit, or opening in which fluid flows into or out of a pump chamber to be an inlet or an outlet respectively.”¹

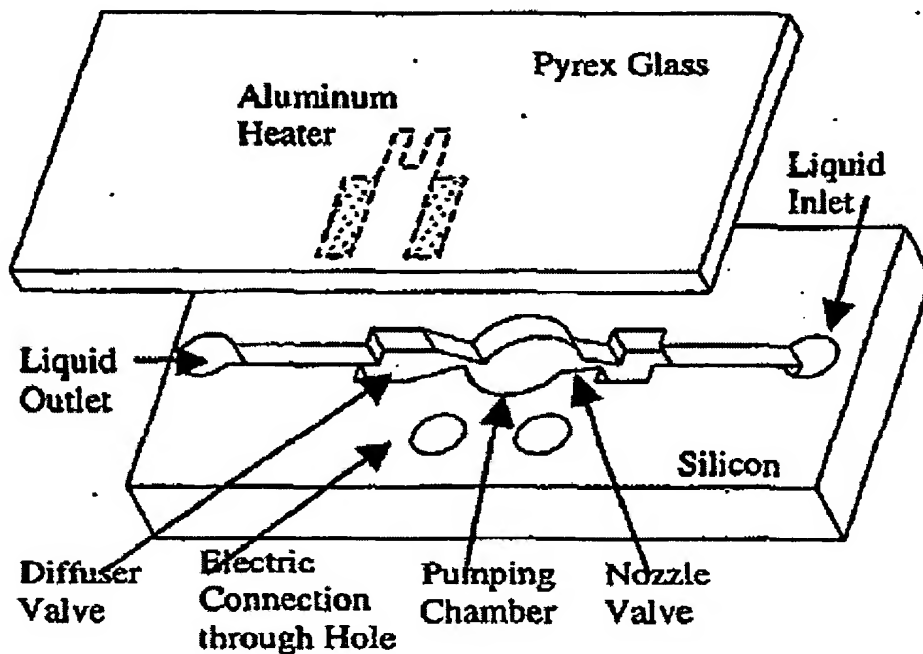
Applicants respectfully disagree with the above-noted assertion for the reasons already of record.² Nonetheless, in an effort to advance prosecution of the application, applicants have amended claim 1 to recite, *inter alia*, a direction of net flow through the micro-pump as being from the fluid entrance to the fluid exit.

Applicants respectfully submit that the Tsai et al. reference fails to disclose, or even suggest, the subject matter presently recited in claim 1. Referring to FIG. 2 of the Tsai et al. reference (reproduced below), the micro-pump illustrated therein is clearly described as having an “inlet” and an “outlet” which are opposite to those recited in claim 1.

¹ Advisory Action mailed August 22, 2008, paragraph 2(a)(i).

² See the reply filed July 2, 2008.

The Tsai et al. reference, FIG. 2



The Office Action Made Final attempts to justify the interpretation of the claim terms in claim 1 by asserting “the Liquid Inlet and Liquid Outlet [to] each function as an entrance and an exit. Each component inherently accomplishes both functions at different times during operation,” relying on a discussion of inherent backflow in the prior art.³ Regardless, applicants respectfully submit that net flow through the pump is uniform. Thus, the “inlet” and “outlet” are not interchangeable, as asserted in the Office Action Made Final and in the Advisory Action.

2. Claim 4

Applicants have amended claim 4 to recite a direction of net flow through the pump, which, as discussed above, is not disclosed or suggested by the Tsai et al. reference. Moreover, claim 4 recites, *inter alia*, “each of the pumping chamber and the heating element

³ Office Action Made Final mailed May 7, 2008, page 5.

has a circular shape” (emphasis added). The Advisory Action asserted that that the Tsai et al. reference discloses this subject matter in FIG. 3(b). Applicants respectfully disagree.

FIG. 3(b) of the Tsai et al. reference uses a circle to illustrate a bubble that is formed due to heating. The reference, however, does not show a circular heater. Rather, the reference shows a meander-shaped heater in which each single meander abuts an adjacent one, i.e., zig-zags.

In view of the above, applicants respectfully submit that the claim term “fluid entrance” recited in claims 1 and 4, when properly interpreted in view of the net flow recited in the claims, does not read on the liquid outlet of the Tsai et al. reference. Further, the claim term “fluid exit” recited in claims 1 and 4, when properly interpreted in view of the net flow recited in the claims, does not read on the liquid inlet of the Tsai et al. reference.

Additionally, applicants respectfully submit that the heating element having a “circular shape,” as recited in claim 4, does not read on the meander-shaped heater of the Tsai et al. reference. Accordingly, claims 1 and 4 are allowable over the Tsai et al. reference. Claims 6-8, 17 and 20 depend from claim 1, and are allowable for at least the reasons that claim 1 is allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

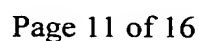
C. Asserted Anticipation Rejection of Claims 1, 6-9, 11-16 and 18

In the outstanding Office, claims 1, 6-9, 11-16 and 18 were rejected under 35 U.S.C. § 102(b) as being anticipated by the Baughman et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

1. Claim 1 recites a “constant inclination angle”

Claim 1 recites, *inter alia*, “a cross-sectional area of . . . the fluid exit varies along a direction of the fluid flow to have a constant inclination angle along its entire length”

The Baughman et al. reference describes a printhead having a nozzle 20 formed in a cover plate 16. The nozzle 20 is clearly shown as having sidewalls that curve in planes normal to the face of the nozzle plate 22, as illustrated in FIGS. 1 and 4D of the reference (reproduced below).



The Baughman et al. reference clearly shows the nozzle 20 has having an inclination angle that is not constant along its entire length, but instead varies so that there is no constant angle along the entire length.

The Advisory Action admitted, “The figures cited by the applicant show a nozzle 20 that would appear to have an angle of curvature along its length.”⁴ Nonetheless, the Advisory Action asserted that “the fluid exit taught in Baughman is disclosed as being formed by a ‘convergent bore’ (col. 3 II . 67). . . . Baughman's disclosure suggest that this wall could be formed as either a flat surface or having an arc”⁵ Applicants respectfully submit, however, that the Baughman et al. reference does not discuss such a “flat surface.” Moreover, the Baughman et al. reference fails to inherently teach such a “flat surface.”⁶ Accordingly, the Baughman et al. reference fails to disclose, or even suggest, a fluid exit having a “constant inclination angle,” recited in claim 1.

2. Claim 1 recites an “outlet manifold”

Claim 1 also recites, *inter alia*, “a fluid exit connected directly between the pumping chamber and an outlet manifold” (emphasis added). The Office Action Made Final and the Advisory Action asserted that the Baughman et al. reference discloses this subject matter. Applicants respectfully disagree.

The Office Action Made Final and the Advisory Action asserted that the “fluid exit” recited in claim 1 reads on the nozzle 20 described in the Baughman et al. reference. However, the Baughman et al. reference states that the nozzle 20 serves to eject ink.⁷ Thus, the nozzle 20 constitutes an end to the ink flow path, i.e., it is not connected to any

⁴ Advisory Action mailed August 22, 2008, paragraph 3(a) (emphasis added).

⁵ *Id.*

⁶ In order to support an inherency argument, the fact that a certain result or characteristic *may* occur or be present in the prior art is not sufficient. (M.P.E.P. § 2112, citing *In re Rijckaert*, 9 F.3d 1531, 1534 (Fed. Cir. 1993)).

⁷ See the Baughman et al. reference at, e.g., col. 4, lines 12-24, and FIGS. 1 and 4D.

downstream element(s). Accordingly, the Baughman et al. reference fails to disclose, or even suggest, the “outlet manifold” recited in claim 1.

In view of the above, applicants respectfully submit that the Baughman et al. reference fails to disclose, or even suggest, each and every element of claim 1, whether expressly, inherently, or otherwise. Accordingly, applicants respectfully submit that claim 1, as well as claims 6-9, 11-16 and 18 depending therefrom, are allowable over the Baughman et al. reference. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

D. Asserted Obviousness Rejection of Claims 3 and 5

In the outstanding Office Action Made Final, claims 3 and 5 were rejected under 35 U.S.C. § 103(a) as being unpatentable over the Tsai et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claims 3 and 5 depend from claims 1 and 4, respectively. Accordingly, claims 3 and 5 are allowable for at least the reasons their respective base claims are allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

E. Asserted Obviousness Rejection of Claim 3

In the outstanding Office Action Made Final, claim 3 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 3 depends from claim 1, and is allowable for at least the reasons claim 1 is allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

F. Asserted Anticipation/Obviousness Rejections of Claim 16

In the outstanding Office Action Made Final, claim 16 was rejected under 35 U.S.C. § 102(b) as being anticipated by, or in the alternative, under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. and Takahashi et al. references as applied to claim 15. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 16 ultimately depends from claim 1, which is allowable over the Baughman et al. reference for at least the reasons set forth above in section C. The Takahashi et al. reference fails to cure the deficiencies in the Baughman et al. reference. Accordingly, claim 16 is allowable for at least the reasons claim 1 is allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

G. Asserted Obviousness Rejection of Claim 17

In the outstanding Office Action Made Final, claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 17 depends from claim 1, and is allowable for at least the reasons claim 1 is allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

H. Asserted Obviousness Rejection of Claim 19

In the outstanding Office Action Made Final, claim 19 was rejected under 35 U.S.C. § 103(a) as being unpatentable over the Baughman et al. reference as applied to claim 13. This rejection is respectfully traversed for at least the reasons set forth below.

Claim 19 ultimately depends from claim 1, and is allowable for at least the reasons claim 1 is allowable. Therefore, applicants respectfully request that this rejection be favorably reconsidered and withdrawn.

I. Conclusion

The above remarks demonstrate the failings of the outstanding rejections, and are sufficient to overcome the rejections. These remarks, however, are not intended to, nor need they, comprehensively address each and every reason for the patentability of the claimed subject matter over the applied art. Accordingly, applicants respectfully submit that the claims are allowable for reasons including, but not limited to, those set forth above, and patentability of the claims does not depend solely on the particular claim element(s) discussed above.

If the Examiner believes that additional discussions or information might advance the prosecution of the instant application, the Examiner is invited to contact the undersigned at the telephone number listed below to expedite resolution of any outstanding issues.

In view of the foregoing, reconsideration of this application is earnestly solicited, and an early and favorable further action upon all the claims is hereby requested.

Respectfully submitted,

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Date: September 5, 2008



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PETITION and
DEPOSIT ACCOUNT CHARGE AUTHORIZATION

This document and any concurrently filed papers are believed to be timely. Should any extension of the term be required, applicant hereby petitions the Director for such extension and requests that any applicable petition fee be charged to Deposit Account No. 50-1645.

If fee payment is enclosed, this amount is believed to be correct. However, the Director is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-1645.

Any additional fee(s) necessary to effect the proper and timely filing of the accompanying-papers may also be charged to Deposit Account No. 50-1645.